Wei Zhao's Notebook

07/11/16

Work finished:

1. Understand and data analysis of the output measurement experiment.
2. Read the literature of gene toggle switch.
3. Learn Mathematica.
4. Learn the example of the gene transcription loop.

Problem unsolved:

1. Further analysis of switching curve.
2. Extension of the switching model (building other types of switches).

07/12/16

Work finished:

1. View genetic circuit model 1,2,3, insulator working principle.
2. Understand the mass balance and dynamic equation of Markoff model in chemical reactions.
3. Mathematica function application.

Problem unsolved:

1. Understand of the FSP algorithm and compared with other ordinary differential equations.
2. Study matrix operations and their practical implications.
3. The construction of the model and the background equation understanding.

07/13/16

Work finished:

1. Learn the working principle of insulators.
2. Study fluorescence determination method.

Problem unsolved:

1. ODE equation algorithm (4 order Runge-Kutta accuracy improvement).

07/14/16

Work finished:

1. Continue to study Mathematica, for the ODE algorithm research and graphics rendering.
2. Interpretation of the work principle insulator.

Problem unsolved:

1. Interpretation of model parameters.
2. Set up the data table.

07/15/16

Work finished:

1. Learn Mathematica.
2. Analysed the gene sequence.
3. Analysed the examples of insulator working.

Problem unsolved:

1. Set the DNA sequence database of Part components.
2. Finish the data and set up model formula.
3. Mathematica mapping (statistical probability map).

NOTEBOOK

07/16/16

Work finished:

1. Report on the output determination of gene loop.
2. Learn Mathematica.
3. Look up model parameter, finish Biobricks table.

Problem unsolved:

1. Reference to the establishment of the model in previous years.
2. Learn Kinetics equation of biochemical reaction.
3. Master the ODE algorithm.

07/18/16

Work finished:

1. Read carefully about SYSU wiki in 2014 and 2015.
2. Learn the biochemical equation.
3. Search the parameters.

Problem unsolved:

1. Collect data.
2. Construct the model in a proper direct.

07/19/16

Work finished:

1. Read the model of Oxford University.
2. Refer and understand some equations.

Problem unsolved:

1. Model parameters.
2. How to search experiment data effectively.
3. Improve the mathematical model or algorithm.
4. Verify and infer the model.

07/20/16

Work finished:

1. Extract the data in Oxford wiki.
2. Extract the data in Freiburg wiki.

Problem unsolved:

1. Find the experiment data in wiki.
2. Simulate the process via software.

07/21/16

Work finished:

1. Clear up the biology system dynamic reaction.

Problem unsolved:

1. Analysed the living example model autonomously.

07/22/16

Work finished:

NOTEBOOK

1. Read Random Fluctuations Reveal Gene Network Parameters.
2. The finite state projection algorithm for the solution of the chemical master equation.
3. Learn Mathematica.

Problem unsolved:
1. The original solution of ode equation.
2. Understand the FSP algorithm and its actual operation.

07/23/16

Work finished:
1. Look up the code of SYSU.
2. Read Insulator Parts to Buffer Synthetic Circuits from Genetic Context.

Problem unsolved:
1. The original solution of ode equation.
2. Probability density distribution of model.

07/25/16

Work finished:
1. The 4st gene circuit model.
2. Read the literature: Simulation of stochastic process of biological system.
3. Read the stochastic dynamic theory of biological system.

Problem unsolved:
1. Write the reaction process.
2. The method of construction of array via Mathematica.

07/26/16

Work finished:
1. Learn Mathematica.
2. Program FSP.

Problem unsolved:
1. Grammar and programing habit.
2. Moving forward.

07/27/16

Work finished:
1. Understanding the finite state projection and related methods for solving the chemical master equation.
2. Simulate the gene circuit.

Problem unsolved:
1. Learn numerical modeling.
2. Learn mathematical modeling.
3. Learn HTML.

07/28/16

Work finished:
1. Read FSP algorithm.
2. Cellular automata.

Problem unsolved:

NOTEBOOK

1. Understand FSP algorithm more deeply.

07/29/16

Work finished:
1. Read FSP algorithm in detail.
2. Learn python.
3. Learn HTML.

Problem unsolved:
1. Try to transform state to finite site using graph theory.

08/01/16

Work finished:
1. Division work of group.

Problem unsolved:
2. Explore FSP improved algorithm.

08/02/16

Work finished:
1. Analyzed relevant conceptions and compared English with Chinese.
2. Clear up propensity function and parameters.
3. Research relevant literature.

Problem unsolved:
1. Markov process and the construction of Markov process transferring array.

08/03/16

Work finished:
1. Learn algorithm.
2. Look up the code.
3. Clear up input parameters.
4. Clear up propensity function.

Problem unsolved:
1. Learn Python and look up codes.

08/04/16

Work finished:
1. Learn Python.
2. Write modeling.

Problem unsolved:
1. Analyze algorithm.
2. Clear up report.

NOTEBOOK